CLAIMS

1. An emission control system for setting fuel injection timing in a diesel engine, the system comprising:

a control module connected to an air pressure sensor, an air temperature sensor, an engine boost pressure sensor, and an engine fuel injection timing module operative to control fuel injector timing of a fuel injection system;

the control module operating to calculate air density from the air temperature and air pressure data received from the air pressure and air temperature sensors;

the control module operating to determine air flow through the engine using engine boost pressure data received from the boost pressure sensor;

the control module operating to determine optimal fuel injection timing by comparing the air flow rate and air density to a fuel injection timing map; and

the control module operating to send a fuel injection timing signal to the fuel injection timing module to alter fuel injection timing.

2. A system as in claim 1 wherein the air temperature sensor detects air temperature within an engine air intake.

3. A system as in claim 1 wherein the air pressure sensor detects air temperature within an engine air intake.

4. A system as in claim 1 wherein the air pressure sensor detects engine boost pressure and air pressure within the intake manifold.

5. A system as in claim 1 wherein the air pressure and temperature sensors are located outside the engine to detect ambient air pressure and temperature.

6. A method of optimizing injection timing comprising the steps of:

providing a control module receiving environmental and operational data including air pressure, air temperature, and engine boost pressure, the control module interfacing with a fuel injection timing module operative to control fuel injector timing of a fuel injection system;

calculating air density from the received air pressure and air temperature data;

determining the air flow rate through the engine based upon the engine boost pressure data contained in a lookup table;

determining optimal fuel injection timing by comparing the air density and the air flow rate to a fuel injection timing map and sending the fuel injection timing to the fuel injection control module; and

altering the timing of the fuel injectors with the injection timing module to operate the engine at maximum efficiency under applicable emission regulations.

7. A method as in claim 6 wherein the optimal fuel injection timing is the most advanced fuel injection timing possible under the emission guidelines.

8. A method as in claim 6 wherein the air pressure is measured within an air intake.

9. A method as in claim 6 wherein the air pressure sensor measures air pressure and boost pressure within an intake manifold.

10. A method as in claim 6 including further altering fuel injection timing as a function of engine load, speed and air/fuel ratio.

11. A method as in claim 6 wherein the air pressure and temperature sensors mounted outside the engine to measure ambient air pressure and temperature.

12. A method as in claim 6 wherein the air temperature is measured within an air intake.